

**In The Drawings:**

Please substitute the one sheet of drawings submitted herewith containing Figures 1-3 in place of the originally filed drawing sheet containing the same Figures.

## **REMARKS**

### **Introductory Comments:**

Claims 1-20 are pending in the application. Claims 1-4, 6-12, 16-17 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bailey et al. (US 6914959). Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey in view of Sugihara et al. (US 5761269). Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US 6292531131) in view of Pellegrino et al. (US 5594769). Claims 7 and 20 are cancelled. The Applicants request reconsideration of claims 1-6 and 8-19.

### **In Response To The Drawing Objections:**

Regarding the drawing objections of the Office Action, the Applicants have amended the drawings in accordance with the Examiner's suggestions such that numbers in the Detailed Description are properly represented in the amended drawings. Further, the discussed claim elements are now properly represented in the drawings or have been cancelled. Claim 20 is cancelled and the elements thereof are now incorporated in the Detailed Description paragraph [0022]. No new matter has been added. The Applicants therefore submit one Replacement Sheet containing Figures 1-3.

The Applicants believe that the drawing objections are overcome in view of the aforementioned amendments thereto.

### **In Response To The Claim Objections:**

Claims 5 and 11 are objected to for informalities. In response to these objections, the Applicants have amended the claims in accordance with

the Examiner's suggestions. No new matter has been added. The Applicants therefore believe these objections are hereby overcome.

**In Response To The 35 U.S.C. 102(e) Claim Rejections:**

Claims 1-4, 6-12, 16-17 and 19-20 are rejected as anticipated by Bailey. Regarding claims 1 and 7, the Office Action alleges Bailey teaches a scanning system comprising: a mount; a detector (24) coupled to the mount and detecting a first X-ray flux and a second X-ray flux and generating at least one detector signal therefrom; a first emitter (22a) coupled to the mount and generating the first X-ray flux at a first angle relative to the detector; a second emitter (22b) coupled to the mount and generating the second X-ray flux at a second angle relative to the detector; and a computer (80) activating the first emitter and the second emitter for electronic scanning such that the first emitter and the second emitter are activated in a source pattern including at least one of a sequential pattern, a random pattern, a simultaneous pattern, or a partial scan pattern, the computer receiving the at least one detector signal and generating an image signal therefrom (figure 1). Further, regarding claim 7, Bailey allegedly teaches each emitter is collimated to view an entire field of view of the detector (figure 1).

Although the Applicants believe claim 1 allowable in view of Bailey, the Applicants nevertheless amend claim 1 to include that each emitter is collimated to view an entire field of view of the detector from claim 7, and claim 7 has been cancelled. The Applicants believe the amended claim 1 to be new and nonobvious because the claim and the prior art differ.

Bailey includes a combined radiation therapy and imaging system. For the radiation therapy portion of the system, Bailey includes a type of collimator subsystem 46 used with an X-ray source 14, as is common in radiotherapy systems. The collimator subsystem 46 is included therein so that the cross-sectional shape and size of the radiotherapy beam used to expose the target region of the patient can be modified, depending upon the cross-sectional size and shape of the target region at the angle of the exposure by the source 40. For the imaging portion of Bailey, only two sources 22A, 22B are used; and no collimator is used in conjunction with those sources. (Column 5, Lines 50-67.)

In contrast, the amended claim 1 includes that *each* imaging emitter is collimated to view an entire field of view of the detector. The collimating in the present invention for the multiple sources and resultant multi-projection imaging eliminates mechanically induced artifacts in the sensitive detection system as the sources are not moved, as they are in Bailey. Bailey only includes collimating the radiation therapy portion thereof for adjusting the therapy beam and does not disclose or suggest collimation for use in the imaging portion of the system. Bailey, therefore, does not include collimating each imaging source as claimed. Therefore, because each and every element of claim 1 is not included in the prior art, claim 1 is believed to be allowable. Claims 2-6 and 8-12 depend from claim 1 and are believed to be allowable for at least the aforementioned reason.

Regarding the rejection of claim 16, the Office Action alleges that Bailey teaches a scanning system comprising: a mount comprising a platform,

wherein the mount further defines (O-shaped gantry) a holding area for supporting patient tissue (62); a mount motor controller moving at least one of the mount or the platform in response to adjustment signals, a detector (24) coupled to at least one of the mount or the platform and comprising a plurality of modules (detectors, 24) receiving a plurality of X-ray fluxes and generating detector signals therefrom; a plurality of X-ray sources (22a, 22b) coupled to the platform and generating the plurality of X-ray signals at various angles with respect to the detector; and a computer (80) generating the adjustment signals as a function of parameters of the patient tissue, the computer further generating an image signal as a function of the detector signals (36).

Although the Applicants believe claim 16 allowable in view of Bailey, the Applicants nevertheless amend claim 16 to include at least three X-ray sources coupled to the platform and arranged in an arc such that the at least three X-ray sources generating the plurality of X-ray signals for at least three different angles along the arc with respect to the detector in accordance with Figure 2, which is not disclosed or suggested by Bailey. Bailey instead includes two sources and does not have them configured in an arc but rather in a line, as illustrated in Figure 1.

The arc configuration of the Applicants eliminates need for the sources to rotate around the object being scanned and allows for immediate emphasis on the object from one or more angles. Bailey, on the other hand includes two linear sources rotating around a patient, as is typical of scanning systems. Therefore, because each and every element of claim 16 is not disclosed or suggested in the prior art, claim 16 is believed to be allowable.

Claims 17-19 depend from the amended claim 16 and are believed to be allowable for at least this reason.

**In Response To The 35 U.S.C. 103(a) Claim Rejections:**

Claims 5 and 18 are rejected as being unpatentable over Bailey in view of Sugihara. The Office Action recognizes Bailey fails to teach at least one of a liquid cooling system, wherein the detector is cooled the liquid cooling system and a cooling system directly cooling an anode of the scanning system nor at least one of a liquid cooling system, a common conditioner for the sources and the detector, or multiple chillers for the sources and the detector. However, the Office Action alleges Sugihara teaches an x-ray CT system having source and detector cooling system (figure 4a).

Claims 5 and 18 depend from claims 1 and 16 and are believed to be allowable for at least this reason. Further, claims 5 and 18 include a liquid cooling system not disclosed or taught by Bailey and Sugihara either alone or in combination. Bailey does not discuss system cooling and Sugihara merely discusses cooling by means of suitable air circulation at low noise for reducing need for a ceiling fan. In contrast, claims 5 and 18 include a liquid cooling system directly cooling imaging system components and thus efficiently enabling higher X-ray outputs. Whereas the air circulation system of Sugihara merely cools all components and does not target cooling on components such as those claimed for allowing them to operate with higher X-ray outputs. Therefore, because each and every element of the claims is not included in the prior art, claims 5 and 18 are believed to be allowable.

Claims 13-15 are rejected as being unpatentable over Hsieh in view of Pellegrino. Regarding claim 13, Hsieh allegedly teaches a mammography scanning system having a detector comprising: a plurality of X-ray emitters adapted to generate a plurality of X-ray fluxes, the plurality of X-ray emitters coupled to a support system (Hsieh's x-ray sources are considered to be supported on a support structure) and directed towards a common focus at varying angles with respect to the focus, wherein each of the plurality of X-ray emitters is collimated to view an entire detector field of view (figure 5). The Office Action recognizes that Hsieh fails to teach an arc-shaped support system. However, according to the Office Action, Pellegrino generally teaches an x-ray mammography system having a support system.

Claims 13-15 are believed to be allowable over the prior art in their current form but have been amended to clarify the Applicants' original intent that the X-ray emitters are coupled to the arc-shaped support system and arranged in an arc formation, in accordance with Figure 3. No new matter has been added. Neither Hsieh nor Pellegrino include an arc-shaped support structure, nor do either of them include that emitters are coupled to the support structure in an arc formation as claimed.

As mentioned, Hsieh includes X-ray sources at different angles, but does not disclose or suggest an arc formation for the emitters or an arc support structure. Moreover, Pellegrino discloses a support structure but does not disclose that the support structure is arc shaped or that emitters are coupled to it in an arc formation. Therefore, because each and every element


of the claims is not disclosed or suggested by the prior art, claims 13-15 are believed to be new and nonobvious.

**Conclusions:**

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 07-0845.

Should the Examiner have any further questions or comments please contact the undersigned.

Respectfully submitted,

By: 

Justin H. Purcell  
Reg. No. 53,493  
28333 Telegraph Road  
Suite 250  
Southfield, MI 48034  
(248) 223-9500

Dated: February 20, 2006